The River Mile Framework

Second - Third Grades

TRM Connections to Washington State Revised Science Standards

Working Model
2/12/2010

TRM Essential Question: How do we simultaneously use and protect our watershed?

Guiding Questions: How do we find patterns within the natural world? How do we use our understanding of patterns (whole & parts) to describe systems in our natural world? What problems do we observe at The River Mile (TRM) and what ideas do we have for solutions?

EALR 1 – Systems: Role of Each Part in a System	
See how parts of objects, plants, and animals are connected and work together.	• Compare & contrast the function of a whole plant or animal with its parts. • Why do the parts need to be connected to function as a whole? • Identify similar parts (i.e., bird beaks) that perform different actions (i.e., break seeds & catch fish). • Identify the different parts of TRM ecosystem. • Make a simple model of TRM to show how the different parts work together as an ecosystem? • Predict what will happen if parts are removed, (e.g., a plant or animal disappears or an invasive species enters the ecosystem).
EALR 2 – Inquiry: Conducting Investigations	
Carry out investigations by using instruments, observing, recording, & drawing evidence based conclusions.	• Plan and carry out an investigation at TRM. Include actions such as accurately observing and describing objects, events, and organisms, measuring recording, and predicting outcomes. • Record data in various ways (e.g., table, bar graph, line plot & pictograph). • Predict, describe in detail, quantify observations, analyze results and draw conclusions using evidence. • Distinguish between observation and inferences. • Communicate using accurate data and summarize results.
EALR 3 – Application: Solving Problems	
Develop a solution to a problem by using a simplified technological design process. Investigate the use of tools.	• After observing TRM ecosystem, or one of it's parts, identify a simple problem (e.g., pet waste, trash, or an invasive species). • Design and implement a solution to the problem. • Evaluate how well your solution solved the problem. • Use simple tools such as a scale, balance, ruler, magnifying glass, thermometer & others as appropriate.

EALR 4 – Physical Science: Force Makes Things Move	
Force on objects makes them move. Changes in forces will cause changes in motion.	• Observe TRM for movement and the forces that cause motion. • Describe changes of motion over time: (e.g. animal movement, seasonal plant growth, wind-blown leaves & soil, or wave action on the shoreline). • Observe & measure seasonal changes in lake water levels. Identify natural & man-made forces that affect the lake levels. • Explain differences you see in the properties of rocks and sand along TRM shoreline. What does this imply about water's force? • Study how the force of water passing through dams generates electricity. How does the force of water leaving the dam affect fish movement & survival?
EALR 4 – Physical Science: Properties of Materials	
The properties of an object depend on its shape and on the material it is made from.	• Observe a variety of objects at TRM. • Describe the object's properties such as size, weight, hardness, color, shape, and texture. • Compare and contrast similar and different properties (e.g., particle size and texture between shoreline sand, soil, and rocks).
EALR 4 – Physical Science: Forms of Energy	
Energy comes in different forms.	• What evidence can you find at TRM for different forms of energy (e.g., light, sound, motion, heat, and electricity)? • Explain how these forms of energy are or are not used in TRM ecosystem.
EALR 4 - Earth & Space Science: The Sun's Daily Motion	
The Sun has patterns of movement that can be inferred by observing and recording shadows cast by the Sun.	• Infer the Sun's daily motion by measuring the position & length of shadows. You can do this by measuring the changing length of tree shadows at specific times during your visit to TRM. • Explain how shadows could be used to tell the time of day.

EALR 4 - Earth & Space Science: Water & Weather	
Water is essential in Earth systems. This is seen by observing and recording changes in weather patterns and Earth formations.	• Observe TRM. Find evidence that water has shaped TRM landforms. Observe & describe places where, or times of year when, water is found in its various forms (e.g., liquid: *morning dew, rain, lakes and streams*; solid ice: *snow, hail, frozen winter ponds*, and gas: *clouds & fog*). • Predict, describe, gather data and explain temperature's role in the changing states of water (i.e., solid, liquid, and gas). • Measure and record changes in weather. Use tools such as rain gauge, a ruler and a thermometer. • Interpret weather data from seasonal charts, graphs and tables and describe how weather conditions changes during the year.
EALR 4 - Life Science: Life Cycles	
Plants and animals have life cycles.	• Select a specific plant to study at TRM. Observe and describe it's life cycle (e.g., seed, sprout, adult, fruits, flowers, and seeds). • Select a specific animal or insect to study at TRM. Describe it's life cycle (e.g., butterfly: egg, larva, pupa, and adult). • Collect data on the population size of a specific plant or animal species. Describe properties such as size, color, and stage of development. Compare the plant or animal population size and observable characteristics from fall to spring. Note any changes.
EALR 4 - Life Science: Changes in Ecosystems	
Changes in ecosystems affect living populations and non-living elements of a defined area.	• Identify 4 ways that TRM ecosystems support life (e.g., providing fresh water, generating oxygen, removing toxic pollutants, and providing sources of useful materials). • Describe 3 or more changes in TRM ecosystem over time and how those changes affect specific plants and animals • Explain the consequences of rapid ecosystem changes such as storms, earthquakes, volcanic eruptions, human land development, or landslides (i.e., 2009 tribal land across from Porcupine Bay). • Explain the consequences of gradual ecosystem changes such as the increase or decrease in temperature, or yearly rainfall. • Describe changes that humans are making in TRM ecosystem and predict how that change could harm or improve conditions for a specific plant or animal.

EALR 4 - Life Science: Variation of Inherited Characteristics	
Plants and animals vary from one another and their parents. These differences serve as the basis for natural selection.	• Observe TRM and collect data on how changes in the ecosystem impact plant growth by observing what happens to a specific plant growing under different conditions, (e.g., different soil, amounts of light, closer or farther from water source or wave action). • Give examples of variation among individuals of the same kind of plant or animal within a population (e.g., tall and short pine trees, different colors wings in moths, or size of beetles). • Compare offspring with their parents. List the features and characteristics that are similar & those that are different. • Predict how different characteristics might help one individual survive better than another (e.g., animals that are stronger or faster or blend into the background, and plants that grow taller or need less water to survive). • If possible, research and observe fossil evidence and compare the fossil characteristics with present day TRM species.
Stewardship of Our River Mile	
	• Propose a plan to solve an identified problem in TRM ecosystem. • What actions can you & your classmates take to implement the plan?

Units of Study that can be reinforced by visits to The River Mile location are:

FOSS Kit: Air & Weather
FOSS Kit: Balance & Motion
FOSS Kit: Insects
FOSS Kit: New Plants
FOSS Kit: Pebbles, Sand & Silt
DROPS Program: Weather
FOSS Kit: Earth Materials
FOSS Kit: Human Body
FOSS Kit: Magnetism & Electricity

NPS Resource Managers Related Projects & Programs: